To remove a Drag and Drop object:

1 Select the Drag and Drop instance that you want to remove, and delete it from the Stage.

2 Select the Drag and Drop component (to the left of the Stage in the quiz template), then display the Component Inspector panel by opening it from the Property inspector, if necessary.

3 Remove the deleted object's instance name from the appropriate column in the Component Inspector panel.

Configuring a Fill in the Blank interaction

The Fill in the Blank interaction uses a question text field, a user entry text field, a control button, and a feedback text field.

To set up a Fill in the Blank interaction:

1 If you are not using a quiz template, place the learning interaction on the Stage. If you are using a quiz template, select the frame on the Interactions layer that contains the Fill in the Blank interaction. (Frame 3, if you have not added or removed keyframes.)

2 Break the movie clip apart (Modify > Break Apart), display the Component Inspector panel, and then type the interaction ID and the question. See "Configuring a Learning Interaction component" on page 354.

3 In the Component Inspector panel, do one of the following to enter one to three possible correct answers:

- Type the text for the responses that the user can enter that are considered correct responses. Select the Correct option to the right of the correct responses.
- To set up the interaction to accept all responses except those you type, enter the invalid responses in the list and deselect the Correct option to the right of them. Then select the Other Responses option, to indicate that all other responses are correct.

4 Specify whether the matching responses are valid only if they match the case of the text you entered (by selecting Case Sensitive) or if they are valid regardless of the capitalization the user enters (by deselecting Case Sensitive).

5 Specify whether the matching response must be an exact match. If you select Exact Match, a correct response matches only if the user enters the text exactly as it appears in your response. With Exact Match deselected, an answer will be evaluated as correct if it contains the correct word. For example, if the answer is zebra and the user enters **striped zebra**, the answer is considered correct. This feature does not work if the correct answer is more than one word.

Configuring a Hot Object interaction

The Hot Object interaction accepts one to eight hot objects. The default sample uses six hot objects.

To configure a Hot Object interaction:

1 If you are not using a quiz template, place the learning interaction on the Stage. If you are using a quiz template, select the frame on the Interactions layer that contains the Hot Object interaction. (Frame 5, if you have not added or removed keyframes.)

2 Break the movie clip apart (Modify > Break Apart), display the Component Inspector panel, and then type the interaction ID and the question. See "Configuring a Learning Interaction component" on page 354.

3 For each object, select or deselect the Correct option to specify whether the object is considered a correct or incorrect response when the user clicks it. You can have multiple correct selections.

4 Select each instance of the Hot Object interaction on the Stage (you can delete the placeholder instances and place your own movie clip instances on the Stage). Use the Property inspector to give each instance the same instance name that you specified in the Component Inspector panel.

Adding and removing hot object distractors

You can change the default number of six distractors (choices) by adding additional distractors or deleting existing distrators. You can include from one to eight hot object distractors in a Hot Object learning interaction.

To add a hot object distractor:

1 Create a movie clip symbol containing the graphics for the hot object distractor. For example, if you have an interaction that has six types of fruit, and you want to add a seventh choice, create a graphic of the seventh fruit and place it in the library.

2 Select the Hot Object component on the Stage, then drag the symbol from the Library panel to the Stage.

3 In the Property inspector, name the instance. See "Naming and registering graphic distractors" on page 370.

4 Add the instance name to the Component Inspector panel for the hot object.

The component does the rest of the work for you at runtime.

To remove a hot object distractor:

1 Select the Hot Object movie clip instance that you want to remove, and delete it from the Stage.

2 Select the Hot Object component (to the left of the Stage in the quiz template), then display the Component Inspector panel by opening it from the Property inspector, if necessary.

3 Remove the deleted object's instance name from the list in the Component Inspector panel.

Configuring a Hot Spot interaction

The Hot Spot learning interaction sets up an interaction in which the user responds by clicking an object (or objects) onscreen.

An example of a hot spot interaction created with the quiz template

To configure a Hot Spot interaction:

1. If you are not using a quiz template, place the learning interaction on the Stage. If you are using a quiz template, select the frame on the Interactions layer that contains the Hot Spot interaction. (Frame 5, if you have not added or removed keyframes.)
2. Break the movie clip apart (Modify > Break Apart), display the Component Inspector panel, and then type the interaction ID and the question. See "Configuring a Learning Interaction component" on page 354.
3. For each hot area, select or deselect the Correct option to specify whether the object is considered a correct or incorrect response when the user clicks it. You can select multiple correct answers.
4. If needed, enter a value for Up State Alpha. This sets the default transparency of the hot spots on the Stage—that is, the transparency before you click an area. To create completely transparent hot spots, enter 0 in the Up State Alpha text box.
5. If needed, enter a value for Down State Alpha. This sets the transparency of the hot spots when they are selected. This setting may vary depending on the graphics in your document. You might want to use it to give users visual feedback after they have successfully clicked a hot spot.
6. You can delete the placeholder instances on the Stage. Place your movie clips on the Stage and use the Property inspector to give each movie clip the same instance name that you specified in the Component Inspector panel.

Adding and removing hot spot distractors

You can include from one to eight distractors (choices) in a Hot Spot learning interaction. You can change the default number of six distractors by adding additional distractors or deleting existing distrators.

In general, you'll be placing the hot spot distractors over another graphic that the user is really intended to see. You may want to make your hot spot assets semi-invisible during authoring to visualize this. You can do this by turning the alpha effect setting down on each hot spot. This setting is overridden by the interaction scripts at runtime.

To add a hot spot distractor:

1. Create a movie clip symbol containing the graphics for the distractor object. For example, if you have an image that will have six hot spots, and you want to add a seventh choice, create a movie clip of the seventh graphic and place it in the library.
2. Select the Hot Spot component on the Stage, then drag the symbol from the Library panel to the Stage.
3. In the Property inspector, name the instance. See "Naming and registering graphic distractors" on page 370.
4. Add the instance name to the Component Inspector panel for the hot spot.

   The component does the rest of the work for you at runtime.

To remove a hot spot distractor:

1. Select the hot spot instance that you want to remove, and delete it from the Stage.
2. Select the Hot Spot component (to the left of the Stage in the quiz template), then display the Component Inspector panel (Window > Development Panels > Component Inspector).
3. Remove the deleted object's instance name from the list in the Component Inspector panel.

Configuring a Multiple Choice interaction

In a Multiple Choice interaction, the user responds to a question with multiple answers; either just one answer or several answers can be correct.

To configure a Multiple Choice interaction:

1 If you are not using a quiz template, place the learning interaction on the Stage. If you are using a quiz template, select the frame on the Interactions layer that contains the Multiple Choice interaction. (Frame 6, if you have not added or removed keyframes.)

2 Break the movie clip apart (Modify > Break Apart), display the Component Inspector panel, and then type the interaction ID and the question. See "Configuring a Learning Interaction component" on page 354.

3 Type the possible responses for the interaction (A–E).

Note: You do not need to provide five responses. You can delete a response, but be sure to replace it or move any following responses up to the previous text box, if necessary, so that there are no blank text boxes between responses.

4 Select or deselect the Correct option to specify whether each response is considered correct or incorrect. You can have multiple correct answers.

Adding and removing multiple-choice distractors

You can include from one to eight distractors (choices) in a Multiple Choice learning interaction. You can change the default number of six distractors by adding additional distractors or deleting existing distrators.

To add a multiple-choice distractor:

1 Select the frame with the Multiple Choice learning interaction in the Timeline.

2 Open the Flash UI Components folder in the Library panel (Window > Library) and drag a CheckBox component to the Stage.

3 In the Property inspector, name the instance. See "Naming and registering graphic distractors" on page 370.

4 Add the instance name to the Component Inspector panel for the multiple-choice distractor.

The component does the rest of the work for you at runtime.

To remove a multiple-choice distractor:

1 Select the CheckBox instance that you want to remove, and delete it from the Stage.

2 Select the Multiple Choice component (to the left of the Stage in the quiz template), then display the Component Inspector panel (Window > Development Panels > Component Inspector).

3 Remove the deleted object's instance name from the list in the Component Inspector panel.

Configuring a True or False interaction

In a True or False interaction, the user responds with an answer of either True or False.

To configure a True or False interaction:

1. If you are not using a quiz template, place the learning interaction on the Stage. If you are using a quiz template, select the frame on the Interactions layer that contains the True or False interaction. (Frame 7, if you have not added or removed keyframes.)
2. Break the movie clip apart (Modify > Break Apart), display the Component Inspector panel, and then type the interaction ID and the question. See "Configuring a Learning Interaction component" on page 354.
3. In the Question text box, type the text of the question you want to ask the user.
4. Select Correct to specify which answer, True or False, is the correct response for the interaction. If you want, you can change these responses to Correct or Incorrect by changing the text of the distractors. For example, you could type **A. Correct** and **B. Incorrect** in the Distractors text boxes.

True or False interaction distractors

The True or False interaction includes a question text field, two RadioButton components, a control button, and a feedback text field. There are no other distractor options to configure.

Adding, naming, and registering assets

Each Flash learning interaction consists of the following assets:

- An interaction component
- Dynamic text fields
- Distractor elements
- User interface (UI) components

The collection of assets for each interaction type is stored within movie clip symbols in the library. These movie clips are intended to provide mobility for the assets so they can be copied to keyframes or among files. The movie clips are only intended to be containers and are not necessary to make the interaction work.

If you have experience handling and naming graphics, you can enter your own instance names for the graphic assets on the Stage. You do not need to use the movie clip containers or the templates—instead, you may add your own assets to the Stage, add a Learning Interaction component to the Stage, then register the assets' instance names in the Component Inspector panel for the interaction.

Keep in mind the following about naming assets:

- Interaction components do not need to be named.
- UI components need to have unique names for similar interaction types.
- Each graphic distractor (Drag object, Target object, hot spot, and hot object) must have a unique instance name.
- Text fields can share the same instance names across multiple interactions.

Once you have named the assets on the Stage, it's important to register those names in the Component Inspector panel for the learning interaction so that the scripts can control the assets.

About naming Learning Interaction component instances

Every interaction has an interaction component associated with it to configure its unique parameters. These components do not need to be named.

Naming UI components (RadioButton, CheckBox, Button, and TextInput)

When you use similar interaction types, you need to give each UI component a unique name. For example, if you create two Multiple Choice interactions, the second interaction requires unique instance names for the CheckBox and the Button components. These new instance names need to be registered in the Component Inspector panel for the learning interaction.

To name a UI component:

1 Select the UI component instance on the Stage.

2 In the Property inspector, type a name in the Instance Name text box.

3 Register the name in the Component Inspector panel for the interaction (see "Registering dynamic text fields and UI components" on page 369).

Naming dynamic text fields

If you have more than one of any type of learning interaction in a quiz—for example, if you have two Drag and Drop learning interactions—the objects in each learning interaction must have unique names. These new unique instance names need to be registered in the Component Inspector panel for the learning interaction. See "Registering dynamic text fields and UI components" on page 369.

To name a dynamic text field:

1 Select the dynamic text field on the Stage.

2 In the Property inspector, type a name in the Instance Name text box.

Note: Make sure to enter the instance name and not the variable name in the Property inspector.

3 Register the name in the Component Inspector panel (see the next section).

Registering dynamic text fields and UI components

After you have entered the instance name for a dynamic text field or Button component in the Property inspector, you need to register the instance in the Component Inspector panel for the interaction.

To register dynamic text fields and Button components:

1 Select the Learning Interaction component (to the left of the Stage in the quiz template), and open the Component Inspector panel, if necessary, from the Property inspector.

2 Click Assets, at the bottom of the panel.

3 Enter the name in the appropriate instance name text box.

Naming and registering graphic distractors

Graphic distractors such as Drag objects, Target objects, hot spots, and hot objects must be named uniquely across all interactions. This means that in a file with two Drag and Drop interactions, each containing four Drag objects, each of the eight Drag objects in the file must be named uniquely. For example, the Drag objects in the first interaction could be named Drag 1, Drag 2, Drag 3, and Drag 4, and the Drag objects in the second interaction could be named Drag A, Drag B, Drag C, and Drag D. This ensures that the scripts work properly and the interactions behave as intended.

To name graphic distractors:

1. Make sure that the objects on the Stage are instances of learning interactions or movie clip symbols.
2. Select an object on the Stage—for example, a Target object.
3. In the Property inspector, type a name in the Instance Name text box.
4. Repeat steps 1–3 for each object on the Stage.
5. Register the names (see the following procedure).

   Note: A sequential naming scheme is usually the easiest to work with–for example, Drag1, Drag2, Drag3, and so on.

To register a distractor instance name:

1. Select the Learning Interaction component (to the left of the Stage in the quiz template), and open the Component Inspector panel from the Property inspector, if necessary.
2. Enter the name in the Component Inspector panel, under Instance Name.

Text field names

Text fields can share the same names from interaction to interaction. That means that the question text field in interaction 1 can be named the same as the question text field in interaction 2, and so on. These names need to be registered with the interaction components, as do all assets names (see "Registering dynamic text fields and UI components" on page 369).

Asset name defaults

The assets supplied in the movie clip interaction containers are prenamed with the instance names listed in the following tables.

Drag and Drop learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton
Reset button	Resets Drag objects	Flash UI Button component	Template_ResetButton

Asset	Description	Object type	Instance name
1-8 Drag objects	Drag object distractors	Movie clip symbol	Drag1 – Drag8
1-8 Target objects	Targets for Drag objects	Movie clip symbol	Target1 – Target8

Fill in the Blank learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
User entry field	User types answer into this text field	Flash UI TextInput component	Template_UserEntry
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton

Hot Object learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton
Reset button	Resets hot object distractors	Flash UI Button component	Template_ResetButton
1-8 hot objects	Hot object distractors	Movie clip symbol	HotObject1 - 8

Hot Spot learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton
Reset button	Resets hot spot distractors	Flash UI Button component	Template_ResetButton
1-8 hot spots	Hot spot distractors	Movie clip symbol	HotSpot1 - 8

Multiple Choice learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton
3-8 check boxes	Check box distractors	Flash UI CheckBox component	Checkbox1-8

True or False learning interaction asset names

Asset	Description	Object type	Instance name
Question text field	Holds question text	Dynamic text field	Template_Question
Feedback text field	Holds feedback text	Dynamic text field	Template_Feedback
Control button	Submits user response and controls navigation	Flash UI Button component	Template_ControlButton
2 radio buttons	True or false radio button distractors	Flash UI RadioButton component	Template_Radio1, Template_Radio2

Setting feedback options for a learning interaction

Feedback options control the text that the user sees before and while responding to an interaction.

To set feedback options for an interaction:

1 Select the interaction component, to the left of the Stage in the quiz template.

2 If the Component Inspector panel is not already visible, open it from the Property inspector; then click Options, at the bottom of the panel.

3 Select Feedback if you want the interaction to present comments to users before and after they submit a response. Then, enter a comment for the following:

- For Tries, enter the number of tries that a user is given to provide a correct response.
- For Initial Feedback, enter the feedback that appears before the user has interacted with the quiz—for example, **Click an object and drag it to the matching object.**
- For Correct Feedback, enter the feedback that appears if the user's response is correct—for example, **Yes, that is correct.**
- For Incorrect Feedback, enter the feedback that appears if the user's response is incorrect and tries is set to 1—for example, **No, that is incorrect.**
- For Additional Tries, enter the feedback that appears if the user's response is incorrect and tries is set to more than 1—for example, **No, that is incorrect. Try again.**

Note: Users are allowed one try only for the True or False learning interaction, so there is no Additional Tries field for that interaction.

Setting Knowledge Track options for a learning interaction

Knowledge Track is an automatic data-tracking feature that allows you to transmit student performance data to a learning management system (LMS), such as Lotus LearningSpace, or to other back-end tracking systems. Knowledge Track works with both AICC- and SCORM-compliant LMS's. Knowledge Track captures and/or stores student information internal to the Flash application and transmits that data to an HTML page.

To successfully send data to a tracking system, you must embed the SWF file containing your learning interactions into an HTML page SWF file and select the HTML template in publish settings for either Flash with AICC Tracking or Flash with SCORM Tracking. To support AICC-compliant LMS's, the HTML that embeds the SWF file needs to be part of a frameset. See "Preparing Flash learning interactions for web hosting" on page 376.

The tracking data captured and transmitted by Knowledge Track is based on an industry standard for courseware-to-tracking-system communications, the AICC (Aviation Industry CBT Committee) specification version 2. This standard specifies the following data elements for each interaction.

You can set values for these data elements using the Component Inspector panel for an interaction:

- InteractionID
- ObjectiveID
- Weighting

Other data elements are automatically set or calculated:

- Question Type
- Correct Response
- User Response
- Result
- Date/Time
- Latency

To set Knowledge Track options for an interaction:

1 Select the Learning Interaction component, to the left of the Stage in the quiz template.

2 If the Component Inspector panel is not already visible, open it from the Property inspector; then click Options, at the bottom of the panel.

3 Select Knowledge Track if you are using the learning interaction in a document created using a quiz template and you want the learning interaction to send data to a server-side learning management database.

4 Enter a name in the Objective ID text box to specify an objective for the interaction.

This is an optional parameter. If the interaction is related to an objective that is set up in the LMS, enter that Objective ID in this text box. Tracking still works if you leave the Objective ID text box blank.

5 Specify the Weighting value for the interaction. The quiz templates use this parameter to calculate the score in the Results page. The default value is 1.

Weighting indicates the relative importance of a question. You can enter any numeric value. If all learning interactions have a weight of 1, they are all scored equally. A weight of 2 counts twice as much as a weight of 1 and half as much as a weight of 4. For example, you can give advanced questions a weight of 3 and beginning-level questions a weight of 1.

Setting navigation options for a learning interaction

Documents created using the quiz templates have built-in navigation; be sure to turn Navigation off if you're using a quiz template. For documents that do not use the quiz template, you can set navigation options that display a Next Question button in your document.

To set navigation options for an interaction:

1 Select the Learning Interaction component, to the left of the Stage in the quiz template.

2 If the Component Inspector panel is not already visible, open it from the Property inspector. Then click Options, at the bottom of the panel.

3 Under Navigation, specify how the interaction proceeds after the user submits a response for this interaction:

- Select Off to disable navigation. Select this option if you are using the quiz templates, because the templates include their own navigation.
- Select Next Button to require that the user click a Next button after submitting a response. In the GoTo Action field, select either Stop or Play. The Next button is a Button component that you can use with stand-alone interactions independent of the quiz template.

  If you want to navigate to a labeled frame instead of the next frame, enter a frame label in the GoTo Label text box.

  The default text for the Next button is Next Question. If you want to change the text, see "Setting control button labels for a learning interaction" on page 375.
- Select Auto GoTo Next Frame to have the interaction proceed to the next frame after the user submits a response.

  If Feedback is deselected and Knowledge Track is selected, the Auto GoTo Next Frame feature can be enabled. This feature submits a score after evaluation and immediately navigates to the next frame for the next interaction.

  Note: If Feedback is selected or Knowledge Track is deselected, Auto GoTo Next Frame is reset to Next Button and an error message appears in the Output window.

Setting control button labels for a learning interaction

All six types of interactions use an instance of the same control buttons: Check Answer, Submit, Next Question, and Reset. The only exception to this is the True/False Interaction, which does not use a Reset button. You can change the label for the instance of each button using the Component Inspector panel.

To change the label for an instance of a control button:

1 Select the Learning Interaction component, to the left of the Stage in the quiz template.

2 If the Component Inspector panel is not already visible, open it from the Property inspector; then click Assets, at the bottom of the panel.

3 Edit the label name under Control Button Labels.

4 Select Control > Test Movie to view the new labels on the buttons

Tracking to AICC- or SCORM-compliant learning management systems (LMS's)

The Flash learning interactions and quiz templates allow easy communication with both AICC- and SCORM-compliant LMS's. The code built into both the Flash documents and the corresponding HTML/JavaScript files send properly formatted data to the LMS. The stand-alone interactions send question data, while the quiz templates track the score and time spent overall.

Because of differences between the two tracking standards (AICC and SCORM), there are differences in the compliance of the files created using the Flash learning interactions and the quiz templates.

To be SCORM-compliant, content must call an initialize command when it is first started, or before any other tracking commands are sent to the LMS. The Flash with SCORM HTML template was designed to initialize communication with a SCORM-compliant LMS when the file is loaded. It also sends a finish communication to the LMS when the file is unloaded, if the finish command wasn't explicitly sent previously.

The files created using both the Flash learning interactions and the quiz templates can send tracking data to an AICC- and SCORM-compliant LMS. Individual interactions do not send overall score and tracking data, but they can send interaction or question data.

Files created by using the quiz templates to comply with either AICC or SCORM standards do not read data from the LMS into the Flash file.

Overview of the communication for AICC- and SCORM-compliant content

The following provides a brief overview of what a student experiences when completing a quiz, along with hidden steps that are not exposed to the student.

AICC communication overview

When a student takes an AICC-compliant quiz, the following events occur:

1 The LMS is opened.

2 The student logs in to the LMS.

3 The student navigates through the course structure to find an assignable unit (AU). In this case, assume it's a Flash quiz, built using a Flash quiz template.

4 The student starts the Flash content (the quiz).

5 The content is located on a web server, for example, http://myserver/flashcontent.htm. To track properly, the Flash file needs to be embedded in the Flash AICC tracking frameset. See "Preparing Flash learning interactions for web hosting" on page 376.

Note: Communication with the LMS, and data tracking, is not exposed to your user.

6 The LMS creates two parameters that are appended to the end of the URL: AICC_URL and AICC_SID. The final URL when the content is launched looks something like the following:

```
http://myserver/flashcontent.htm?AICC_URL=http://mylmsserver/
   trackingurl.asp&AICC_SID=12345
```

7 The student progresses through the quiz.

8 The Flash learning interaction sends the tracking data to the LMS through the HTML/JavaScript tracking files. The tracking data is sent when the student answers a question or progresses to the next page.

SCORM communication overview

When a student takes an SCORM-compliant quiz, the following events occur:

1 The LMS is initialized.

2 The student logs in to the LMS.

3 The student starts a quiz built using a Flash quiz template.

4 The content is embedded in the Flash/SCORM HTML template, which is opened in a SCORM-compliant frameset.

Note: This is not exposed to the user.

The LMS is responsible for creating the SCORM-compliant frameset, which includes all the necessary functions to communicate back to the LMS.

5 The student progresses through the quiz.

6 The Flash file sends the tracking data to the LMS through the HTML/JavaScript tracking files.

Preparing Flash learning interactions for web hosting

In order for web users to be able to see your Flash application, you need to embed it into a web page. The steps to prepare AICC- and SCORM-compliant files for web hosting are slightly different and are covered in the following two sections.

Preparing an AICC-compliant learning interaction for web hosting

To send tracking data to an AICC-compliant LMS, you need to enable tracking for the quiz and then publish the Flash application using the Flash with AICC Tracking template. You must place the file generated by Flash on your web server in the same directory and modify the frameset file with the name of your quiz, then place it on the web server with the HTML and SWF files. In addition, your LMS must be AICC-compliant and reference the frameset. This file is called `frameset.htm` by default.

To prepare an AICC-compliant file for web hosting:

1 Open the document in Flash.

2 Select File > Publish Settings.

3 In the Publish Settings dialog box that appears, make sure that at least both Flash (.swf) and HTML files are selected in the Formats panel.

4 Click the HTML tab at the top of the Publish Settings dialog box and select the Flash with AICC Tracking template from the Template pop-up menu.

5 Click the Publish button and close the dialog box.

6 Place the files produced by publishing the Flash file and any files linked (such as, MP3 or FLV) on the web server in the same directory.

Additional files are created if Detect Flash Version is selected in the HTML tab of the Publish Settings dialog box. Make sure to copy all the HTML files to your web server but not the FLA file.

7 Open the Learning Extensions Srvr Files subfolder, located in the Flash MX 2004 program folder in the subfolder en/First Run/HTML/Learning Extensions. Copy the contents of this folder (frameset.htm, results.htm, and the scripts subfolder) to the same web server directory as the SWF file and the HTML file published in Flash.

8 Open the new copy of the frameset.htm file in a text editor.

The following lines are found in the frameset.htm file:

```
<frameset frameborder="0" border="0" framespacing="0" rows="*,1">
<frame src="Untitled-1.htm" name="content" frameborder="0">
<frame src="results.htm" name="cmiresults" scrolling="0" frameborder="0">
```

9 In the second line, change `Untitled-1.htm` to the name of the HTML file you published in Flash (typically the HTML filename specified in the formats Tab of Publish Settings).

The main file references any HTML files that were created in the publishing process. For example, if myQuiz.htm, myQuiz_content.htm, and myQuiz_alternate.htm were created by publishing the document, myQuiz.htm replaces Untitled-1.htm in the frameset.htm file. Then, myQuiz.htm calls myQuiz_content.htm and myQuiz_alternate.htm when necessary.

10 Start the LMS system (or create the AICC Course Descriptor Files) that references the frameset.htm file.

Preparing a SCORM-compliant learning interaction for web hosting

To send tracking data to a SCORM-compliant LMS, you must enable tracking for the quiz and publish the learning interaction using the Flash with SCORM Tracking template. In addition, you must place the files generated by Flash on your web server in the same directory.

To prepare a SCORM-compliant learning interaction for web hosting:

1. Open the document in Flash.
2. Select File > Publish Settings.
3. In the Publish Settings dialog box that appears, make sure that at least both Flash (.swf) and HTML are selected in the Formats panel.
4. Click the HTML tab at the top of the Publish Settings dialog box and select the Flash with SCORM Tracking from the Template pop-up menu.
5. Click the Publish button and close the dialog box.
6. Place the files produced by publishing the Flash file on the web server in the same directory.
7. Start the LMS system and reference the name of the HTML file. Make sure the LMS is set to launch the SCORM tracking frameset.

Extending learning interaction scripts

Note: The information in this section is intended for intermediate and advanced developers who want to extend the interaction capabilities.

The Flash learning interactions use a very organized data structure to store and retrieve information about each interaction session. This data structure powers the evaluations and opens up new possibilities for developers wanting to extend tracking features. You can use it to retrieve industry-compliant tracking data. This data structure is called the SessionArray.

Note: SessionArray and session are reserved keywords on the level where the interactions reside. Do not use these words as identifiers for other data.

Accessing cumulative tracking data through the SessionArray

The following is an overview of how data is tracked through the SessionArray.

- When the Flash application is run, the first interaction component to load creates a new Array on the level of the interaction assets.
- The component then creates a new instance of the LToolBox global class in index0 of the Array. The instance of `LToolBox` is a storage place for all of the interaction's data. Data is set or retrieved from the instance by using predefined property names. See "Predefined property names" on page 379.
- When the Timeline moves to the second interaction, that interaction's component creates an instance of `LToolBox global class` in index1 of the SessionArray.
- When the Timeline moves to the third interaction, that interaction's component creates an instance of `LToolBox global class` in index2 of the SessionArray. It continues with index3, index4, and so on, until all interactions are in an index.
- At the end of a series of interactions, all the data processed during those interactions are available and organized.

Note: The SessionArray is used the same way in the stand-alone interactions and the quiz interactions.

Possible uses

This information is most useful to developers who need to extend tracking or analysis of the interactions, including creating customized quiz environments and creating quizzes in a format different from that of the Flash quiz templates.

Tracking properties available in the SessionArray

The property names reference standard interaction tracking values for both AICC and SCORM LMS's. You can retrieve an interaction's properties by referencing its location in the following command:

```
SessionArray[n].[property_name]
```

For example, to reference the `interaction_id` value for interaction #1, you would use this command:

```
SessionArray[0].interaction_id
```

To reference the result value for interaction #2, you would use this command:

```
SessionArray[1].result
```

Predefined property names

The following table describes the predefined property names.

Property name	Description
`interaction_id`	Unique interaction name
`interaction_type`	Type of interaction
`objective_id`	Objective identification number
`weighting`	Weighting value for this interaction instance; some interactions can have more weight than others
`correct_response`	Formatted correct response returned from the user parameters
`student_response`	Formatted student response returned from the evaluation
`result`	Result of the evaluation
`latency`	Elapsed time during this interaction session
`dateStamp`	Date when the interaction occurs
`timeStamp`	Time when the interaction starts

All the methods and properties of the `LToolBox` global class are available within each SessionArray index.

Basic structure of the Learning Interaction scripts and components

Now that you know how the interaction data are stored and retrieved, here's a little more information to round out the picture. The Learning Interaction components are really the heart of the e-learning setup. They collect user parameters and build the SessionArray and the interaction event handling functions on the level of the interaction assets. That is, they accept user parameters and configure the environment and assets accordingly. If you want to examine how these work, you'll need to open the scripts in the Library panel.

The majority of the scripts lie in one of two places. The first is the `LToolBoxglobalclass` script. This script processes data storage and data formatting for the interaction. The second script location is within each interaction component. These scripts initialize event handling functions triggered by the interaction assets. This is where the user parameters and interaction assets are initialized and the interaction evaluations scripts lie. Even though these scripts are built on the component level, they are initialized on the same level as the interaction assets and submit data to the SessionArray on the interaction assets level.

To explore the scripts or add to them, look in the library for the 1_GlobalClass folder to access the `LGlobalClass` movie clip that contains the `LToolBoxglobalclass` script. Look in the 2_Components folders to access each Learning Interaction component script. Each script is split into commented sections that are described at the top of the script. Most of the script sections are built within functions for modularity.

Reviewing or editing the LToolboxClass script

The `LToolboxClass` script creates a built-in object that each interaction can use for data storage and basic functionality. The data pattern and functionality shared by all interactions is defined in this script. You can access the `LToolboxClass` script from the library.

To review or edit the LToolboxClass script:

1. In the Library panel, select Learning Interactions > Assets > Controls > ComponentSuperClass.
2. In the ComponentSuperClass folder, double-click the SuperClass movie clip to open it in symbol-editing mode.
3. In the Timeline for the movie clip, select Frame 1 and open the Actions panel, if necessary (Window > Development Panels > Actions).
4. Review or edit the script, as desired.

APPENDIX
Using Samples and Templates

Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 come with several samples and templates to help you get started. This appendix contains information on both how to use samples and how to use templates.

Using samples

One of the quickest ways to learn Flash is to look at existing sample files to see how they were created. Each of the samples provided is described in the subsections below.

To view the published application file (.swf), you can link to it directly from the following pages describing each sample application. To view the design file (.fla) for a given sample, open the file from within Flash. Some of these samples are complete applications, while others are simple applications that are intended to introduce a concept that you can use to build your own Flash content.

To open a sample FLA file:

1 To open a sample file in Flash select File > Open.

2 Do one of the following to open the FLA file:

- If you're using a Windows 2000 or XP, operating system, browse to <boot drive>\Documents and Settings\<username>\Local Settings\Application Data\Macromedia\Flash MX 2004\<language>\Configuration\Samples\<sample folder> and double-click <sample.fla>.

  Note: If the Application Data folder is hidden, you'll need to change your Windows Explorer settings to see the folder.

- If you're using a Windows 98 operating system, browse to <boot drive>\Windows\Application Data\Macromedia\Flash MX 2004\<language>\Configuration\Samples\<sample folder> and double-click <sample.fla>.
- If you're using a Macintosh operating system, browse to <Macintosh HD>/Applications/Macromedia Flash MX 2004/First Run/Samples/<sample folder> and double-click <sample.fla>.

See the following sections for information and links to the samples:

- "Using the accessibility features in Flash" on page 382
- "Building a photo scrapbook" on page 382
- "Customizing the Flash Player context menu" on page 382
- "Using device font masking" on page 382
- "Developing multilingual content" on page 383
- "Understanding text enhancements" on page 383
- "Building custom panels with the Extensibility API" on page 383
- "Building a news reader (Flash Professional only)" on page 383

The Macromedia website contains even more samples. You can view them at: www.macromedia.com/go/flashmx_samples.

Using the accessibility features in Flash

This sample shows how you can use the accessibility features of Flash. Features covered in this sample include tab ordering, components, and the Accessibility panel. In this sample, you can see how to use the new authoring tool features and user interface that are geared toward building applications containing the accessibility features. An arrow moves to indicate which focusable element on the Stage has the focus. Explore the source code to learn more about how to take advantage of the Flash accessibility features.

Building a photo scrapbook

This sample shows how to build an interactive photo scrapbook easily using Behaviors instead of scripting. Behaviors provide an easy way to add interactivity to your Flash content without having to write ActionScript. In this example, multiple behaviors are combined to create an interactive scrapbook. Explore the source to learn more or to customize it to add your own pictures.

Customizing the Flash Player context menu

In this sample, you can see how to add your own custom options to the Flash Player context menu using ActionScript 2.0. This sample uses ActionScript to modify the context menu by adding cut, copy, and paste functionality that can be applied to the drawing objects on the Stage. The source includes the document file (.fla) and the ActionScript file (.as) that defines the ClipBoard class. Explore both the files to learn more about the context menu and writing classes with ActionScript 2.0.

Using device font masking

This sample explores the new Flash Player support for masking device fonts. The main features covered in the sample are device font masking, components, and scriptable masks. Newly added support in Flash Player for masking device fonts expands the possibilities for using scriptable masks on Flash content. Device font masking allows device fonts to be used inside components that mask their content, as well as custom masks that you create. This sample shows examples of both types of masking.

Developing multilingual content

This sample, featuring the Strings panel, shows a streamlined approach to developing and managing content in several languages. The new Strings panel provides for easy and fast content development in different languages. Localized content for text fields inside the document is kept in language-specific XML files in directories alongside the document. This example has content in several languages. The language displayed corresponds to the current language of the host operating system. Explore this document to see how the Strings panel manages localized content.

Understanding text enhancements

This sample uses the many new text enhancements added to Flash MX 2004. The features highlighted in this sample are text styles, inline images, hyperlink improvements, and small text optimization. The text enhancements provide better and more precise control over text as it is entered in the Flash Player. This example loads an external HTML file named sample.html into a text field in the SWF file. However, you could use any text file that incorporates a tag-based format like XML or HTML. New support for Cascading Style Sheets allows Flash to style the text in a given text field for each tag before displaying it. This example uses a style sheet named style.css. Additionally, Flash Player supports the `img` tag, allowing inline images that your text will wrap around.

Building custom panels with the Extensibility API

This sample covers how to design and build a panel to control the functions of Flash. The Trace Bitmap panel was built using the extensibility API available in Flash. The Extensibility API is a series of Javascript methods and properties that correspond to methods and properties inside the Flash application. Explore the document to see how the Javascript commands are used and to get ideas for building your own.

Building a news reader (Flash Professional only)

This sample provides an interface to read the latest news at DevNet on macromedia.com. The addition of the databinding user interface in Flash MX Professional 2004 allows users to build interfaces that connect to, retrieve, and display remote data without writing any code. The new components provided have built-in data awareness, allowing several possible scenarios with web services, XML documents, and more. Explore this sample to see how these components are connected to a Rich Site Summary (RSS) feed on macromedia.com.

Using templates

Flash is equipped with several templates to help streamline your work. See the following sections for information about how to use each template:

- "Using rich media templates " on page 384
- "Using video templates (Flash Professional only)" on page 385
- "Using the Photo Slideshow template" on page 386
- "Using presentation templates" on page 387
- "Using the screen presentation templates (Flash Professional only)" on page 388
- "Using the mobile device templates" on page 390
- "Using quiz templates" on page 390
- "Using form application templates (Flash Professional only)" on page 390

To create a new document using a template:

1 Select File > New.

2 In the New Document dialog box, click the Template tab.

3 In the New from Template dialog box, select a Presentation template.

4 Add additional keyframes or screens to the presentation as needed.

5 If you add keyframes, make sure that all layers have the same number of keyframes.

6 Add your own content to the presentation.

7 Save and publish the file.

For specific information about how you can use a template, see the instructions for each template type.

Using rich media templates

Rich media templates facilitate the creation of standard rich media types and sizes defined by the Interactive Advertising Bureau (IAB) and accepted by the industry today. For more information on IAB-endorsed ad types, visit the IAB site at www.iab.net.

Testing with rich media templates

Ads should be tested for stability in a variety of browser and platform combinations. Your application is considered stable if it doesn't cause error messages, browser crashes, or system crashes.

Browser compatibility and requirements with rich media templates

You should work with webmasters and network administrators to create detailed testing plans that include tasks relevant to your specific users. These plans should be publicly available and updated regularly. Also, vendors should publish detailed plans indicating the browser and platform combinations in which their technologies are stable. Examples are available at the IAB Rich Media testing site at www.iab.net/standards/guidelines.asp. In addition, there may be additional requirements on size and file format of ads that vary by vendor and site. Check with your vendor, ISP, or the IAB to learn about these requirements that may affect the ad's design.

More information on rich media

The Macromedia Flash Advertising Alliance (MFAA) is an industry alliance focused on furthering Rich Media advertising and delivering great advertising experiences online. The MFAA offers a community discussion forum for advertising-related issues, technical resources for designers in the advertising space, and a list of voluntary guidelines for authors to guarantee the best possible Internet advertising experience.

Visit the MFAA and participate in the ongoing discussion at the Macromedia Flash Advertising Alliance website at www.mfaa.org.

Using video templates (Flash Professional only)

This section covers creating Flash content using video and includes instructions on using the video templates.

Flash MX Professional 2004 provides new ways to creatively use and deploy video in your Flash projects. The ability to play back external Flash Video (.flv) files enables authors to use video in more projects that will be viewable by wider audiences. The video templates provided with Flash Professional 2004 can help you create video presentations and user interfaces for selecting from multiple bandwidth–tuned streams of video.

Using the Bandwidth Selection template (Flash Professional only)

The Bandwidth Selection template uses forms and components to present the selection interface. This interface allows end-users to control how much content they receive and lets authors tailor their applications to a variety of connection speeds. Once the user has made a speed selection, the media playback component is directed to play the chosen video.

The Select screen contains radio buttons that allow bandwidth selection. ActionScript to handle the selection of radio buttons is included within the Timeline of this screen.

To change the option labels or the number of options that users is presented, you can add, remove, or edit the components on the Select form.

Setting the URLs to the video content (Flash Professional only)

The media playback component progressively downloads Flash Video (.flv) files without requiring that they be embedded in the SWF file.

The `data` property of the radio buttons is set to a string that is appended to a base string to properly form the correct URL. For example, if the user selects High Bandwidth and the base string is cartoon, the file that is loaded is cartoon_hi.flv.

To change the base string, open the Actions panel and select Frame 1 of the Actions layer of the Select screen. Edit the following ActionScript according to the instructions within the comments:

```
// Replace  "test" with your own base string. Be sure
// to keep the quotes.
var video_base:String = "test"
```

When the user makes a selection, the code appends the base string you've set with the string stored in the data property of the radio button, and the media playback component loads the media.

Using the Video Presentation template (Flash Professional only)

The Video Presentation template uses slides, media components, and behaviors to create a self-running presentation that progresses according to cues from the video playback. Video presentations are great for self-running demos, kiosks, or presentations to audiences over the web. At the end of the presentation, viewers are given the option to play the presentation again from the beginning.

You can customize the presentation, add your own video and content, and customize the media playback component to broadcast events when you want.

Adding video (Flash Professional only)

The media display component on the Video slide handles the playback of the video in this presentation. To add your own video to the presentation, select the component on the Stage and replace the current value of the URL property with the URL of your media. Remember that once you publish, the SWF file always looks for the video at that location, so relative paths are recommended over hard-coded paths.

Setting cue points with the video templates (Flash Professional only)

Cue points are also set as properties of the media display component in the Parameters tab in the Component Inspector panel. You add new cue points to the list using the Add (+) button above the Cue Points list. Remove cue points with the Delete (-) button. Each cue point should be given a name and position.

If you give your cue point names and slides the same names, your presentation automatically navigates to the corresponding slide when a cue point is encountered.

Position is a point in time during the playback of the media file, starting from the beginning of the file, which is 0:0:0:0 (hours: minutes: seconds: frames/milliseconds). For example, to place a cue point 10 seconds into the file, enter **0:0:10:0**.

Adding content to the video templates (Flash Professional only)

Adding content to the video templates is as easy as adding new slides to the presentation and creating graphics and text, importing media, and adding animation. There are a few slides with some content to help get you started, but you can replace the content on the slides. After you've added content, you can use the Behaviors panel to add transitions between slides for eye-catching animation.

For more information on adding slides and transitions, see the instructions in the section "Using the screen presentation templates (Flash Professional only)" on page 388.

Using the Photo Slideshow template

The Photo Slideshow template allows you to easily create and customize a photo slideshow.

Preparing your photos with the Photo Slideshow template

Photos must be in a suitable format to make use of the Photo Slideshow template. Flash lets you import images in a variety of formats, but JPEGs typically work best for photographs. For best results, save your photos as JPEGs using an image-editing program like Macromedia Fireworks. Each image should have a size of 640 x 480 pixels and should be named in a numbered sequence. For example, for three files, the names could be photo1.jpg, photo2.jpg, and photo3.jpg.

Importing photos with the Photo Slideshow template

Once your photo sequence is ready, you can import the sequence into a SWF file.

To import your files:

1 Select the layer of photos included in the example called Old Photos, and then click the trash can icon to delete it.

2 Create a new layer by clicking the Insert Layer button, and name this new layer My Photos. Make sure that this new layer is the bottom-most layer.

3 Select the first blank keyframe in the My Photos layer and select File > Import, then locate your photo sequence.

4 Select the first image in the series and click Add, then click Import.

5 Flash recognizes that your image is part of a series and queries you to import all files in the series. Click Yes to complete the import process.

Adding finishing touches with the Photo Slideshow template

Flash places each of your images on separate keyframes. If you have more than four images, make sure that all the other layers have an equal number of frames. Your images appear in the Library panel. You may safely delete the old images that were included in this document from the library if you wish. Change the title, date, and caption at the top for each image. You can replace text as desired. You do not have to worry about the photo field. The template automatically determines how many images are in your document and indicates which photo you are currently using.

Using autoplay mode with the Photo Slideshow template

The Photo Slideshow template also has a built-in autoplay mode that automatically changes the photo after a set delay. The template is set to a default delay time of 4 seconds, but you can easily change this.

To adjust the delay:

1 Unlock the _controller layer.

2 Select the controller component.

3 Display the Parameters tab in the Component Inspector panel by selecting Window > Development Panels > Component Inspector. The Parameters tab is selected by default.

4 Select the delay parameter and change this value to a new delay value in seconds.

5 Save and Publish your document.

Using presentation templates

The presentation templates included with Flash help you create, customize, and publish your presentations.

Creating a slide presentation

Creating a slide presentation is as easy as adding new keyframes. Flash provides three slide layouts to get you started.

To create a slide presentation:

1 Select File > New.

2 In the New Document dialog box, click the Template tab.

3 In the New from Template dialog box, select a Presentation template.

4 In the Slide layer, add a keyframe for each slide in your presentation. For example, if your presentation has ten slides, add ten keyframes.

5 On each keyframe in the Slide layer, add the information you want to include in that slide. You can create or import graphics, as well as add your company's logo, text, video, or audio to your presentation.

6 Make sure that all other layers have an equal number of frames.

7 Save and publish your document.

For more information on using the Timeline, see "Using the Timeline" in Getting Started Help.

Presenting your slides

Use the controls at the bottom of the application or your keyboard's arrow keys to move from slide to slide during your presentation. Press the Left Arrow and Right Arrow keys to move to the corresponding previous and next slides. Press the Up Arrow and Down Arrow keys to jump to the first and last slides.

You can also print each slide in your presentation by clicking the Print icon. If you know that you won't be printing your slides, you can delete the icon from the layout.

Customizing your slide presentation

If you want to change the colors that the template uses, select Modify > Movie and change the background color. The presentation background changes to the newly selected color. Additionally, many templates come with alternate backgrounds. Show and hide the additional background layers to expose alternate designs.

You can match the background to your company's color scheme. Or you can select something bright and eye-catching to really capture your audience's attention.

Using the screen presentation templates (Flash Professional only)

The screen presentation templates included with Flash MX Professional 2004 use screens to make it easier for you to create a professional-looking slide presentation. You can add new slides to the outline and place text, graphics, imported media, and components on those slides to add to content.

After adding slides, you can use the Behaviors panel to add transitions between slides. Flash provides some sample slides with transitions to help you get started.

After you've customized your presentation, preview it by selecting Control > Test Movie from the application menu.

Slides come with built-in navigation. Use the arrow keys on your keyboard or the navigation buttons that are part of the template's design to move forward and backward through your presentation.

Creating slides with the screen presentation templates (Flash Professional only)

The Screen Outline pane shows thumbnails of the slides that appear sequentially in your presentation. There are four ways to add new slides to a presentation.

To create a slide:

1 Create a new file using one of the screen presentation templates.

2 Do one of the following to add new slides to the presentation:

- Select Insert > Screen.
- Press Enter.
- Click the Pus (+) button in the header of the Screen Outline pane.
- Right-click to open the context menu, then select Insert Screen.

3 You can create slides that share graphical content such as logos by inserting nesting slides and placing the shared content on the parent slide. For example, the content that appears on the slide labeled Presentation appears on all the slides in the presentation. Insert nested screens by right-clicking in the Screen Outline pane and selecting Insert Nested Screen.

For more information on using slides and the outline pane, see Chapter 12, "Working with Screens (Flash Professional Only)," on page 197.

Adding transitions to the screen presentation templates (Flash Professional only)

After you've customized the content of your presentation, you can add animated transitions that help illustrate your points. You use the Behaviors panel to add transitions to your presentations.

To add transitions to a screen presentation:

1 Select the screen for which you'd like to add a transition.

2 If the Behaviors panel isn't visible, select Window > Development Panels > Behaviors.

3 Click the Add button (+) in the Behaviors panel and select Screen > Set Transition.

4 Customize your transition in the dialog box. For information about each transition style available, see "Creating controls and transitions for screens with behaviors (Flash Professional only)" on page 209.

5 Click OK once you've finished designing your transition.

6 Select the event on which you'd like your transition to start. The most common events for slide transitions are `onShow`, when the slide becomes visible, or `onHide`, when the slide is hidden.

For more information on behaviors, see "Controlling instances with behaviors" on page 57.

Using the mobile device templates

Flash content is viewable across multiple browsers, platforms, and mobile phones. You can author the following:

- High-quality animations
- Games
- Rich-media custom user interfaces for devices and desktop systems
- Immersive e-commerce and business solutions

In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.

The mobile device templates let you create content for many mobile devices available today. Use the device skins in the templates to preview your content as it will look on the device.

Note: The skins are on guide layers and won't export with your content or appear at runtime.

For more information on authoring Flash files for mobile devices, please visit the Macromedia Mobile Devices site at www.macromedia.com/devnet/devices/.

Using quiz templates

You can use the quiz templates to create self-scoring quizzes with several different interaction types. For complete information about using the quiz templates, see Chapter 19, "Creating E-learning Content," on page 349.

Using form application templates (Flash Professional only)

Flash MX Professional 2004 provides two templates you can use to create form-based applications:

- Query-Error-Response template
- Windowed Application template

Query-Error-Response template (Flash Professional only)

The Query-Error-Response template helps you create applications that perform a simple query to a remote data source, and then, depending on the outcome, display the results in a response form or show an error on an error form. This type of application is useful when performing queries on web services, since they are structured as a simple query/response transaction. There are two steps for using this template:

- Configure your service
- Customize your forms

Configuring your service

The first step is to configure the service that your application is going to call. The template uses a web service connector. If you are using a web service as your data source, you can configure the web service connector in the Parameters tab in the Component Inspector panel. Enter the URL to the service in the WSDL field, then choose the operation your application will call.

You can replace the web service connector with another connector appropriate to your application from the Components panel. If you choose your own connector, you can safely delete the web service component, but you must edit the actions in Frame 1 of the Application form to replace "wsc" with the instance name of the connector you created. This ensures that the Submit button triggers your service.

For more information about web service and other connectors, see "Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 Components" in Using Components Help.

Customizing your forms

The next step is to customize your forms. The Query form should contain fields that correspond to the parameters of your service. The Response form should contain the fields that correspond to the results of your service. The Error form displays an error message to the user that something has gone wrong in the process of calling the service. You can display any message you choose on the Error screen.

To customize the Query form:

1 Select the Query form in the Screen Outline pane.

2 Use components from the Components panel, such as text input fields, radio buttons, combo boxes, and others, to create the input fields for the Query form.

3 Once you've laid out your form elements, use the Parameters tab in the Component Inspector panel to create bindings between your components and the parameters of your service connector.

To customize the Response form:

1 Select the Response form in the Screen Outline pane.

2 Use components to create fields that will display the results.

For example, if your service is a weather service returning temperature, you could use a label component to create a non-editable text display.

Once you've laid out your components, use the Parameters tab in the Component Inspector panel to create bindings between your components and the results of your service connector.

To customize the Error form:

1 Select the Applications form. The Error form is shown using ActionScript in Frame 1 of the Applications form, during processing of the service call. The following are the two event handlers:

```
function status (stat) {
  // Handle status message for errors
  // If error,
  // showError();
}

function result (res) {
  // Handle result message for errors
  // If error,
  // showError();
}
```

2 You can replace the bodies of these functions with your own code to interpret the status and result messages and do one of the following:

- Catch an error and show the error screen.
- Go directly to the results screen to display the service's response.

To learn more about the result and status messages of a service call, see "Data Integration (Flash Professional Only)" on page 233.

Windowed Application template (Flash Professional only)

The Windowed Application template helps you create a windowed application that consists of layered content panes. These panes are draggable, and they rise to the topmost layer when the focus is on them. Each window can contain different content for the user to interact with.

The window components that load the subforms are on the Application form. The `contentPath` property of each window component corresponds to the instance name of the form that it will load at runtime.

Modifying and adding window content

Window content is created on subforms of the Application form. The template comes with four forms: a calendar, a DataGrid component showing simulated inbox content, a scroll pane displaying an image, and a login form.

To modify window content:

1 Select any form in the outline and replace the contents with components of your choice. You can even add data connectors to populate your components with remote data. For more information about data connectors, see "Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 Components" in Using Components Help.

2 After altering the contents of a form, make sure that the window component that will load the form is sized properly, so your form's content won't appear clipped at runtime.

To add new windows and content:

1 Create a new form in the Screen Outline pane and give it an instance name. Make sure that its `visible` property is set to `false`.

2 Create a new window component on the Application screen, and set its `contentPath` property to the instance name of the form you've created.

3 Add content to your new form.

At runtime, a copy of your form is loaded into the window component.

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